Understanding Earnings Quality

Patricia M. Dechow
Defining Earnings Quality

HIGH QUALITY EARNINGS
Reflect the economics of the business
Are sustainable (are a good indicator for the future)

LOW QUALITY EARNINGS
*Do not* reflect the economics of the business
Have been manipulated/contain errors
Are not sustainable (are a poor indicator for the future)

Understanding the factors that cause earnings quality to differ is a key research area in accounting.

– Important for investing, auditing, SEC in monitoring and regulating, banks providing loans, etc.
Operationalizing Earnings Quality

- Concept of earnings persistence

\[ \text{Earnings}_{t+1} = \alpha + \beta \text{Earnings}_t + \varepsilon \]

\( \beta \) closer to 1 \( \Rightarrow \) earnings are more sustainable
Factors that Affect Earnings Quality

Underlying Economics

- Industry Structure
- Firm Structure and Investment Opportunities
- Stage of Life Cycle

Earnings Quality
Chris starts a business

Cup and straw = 0.05
Lemon = 0.15
Sugar = 0.10
Total = 0.30
I will pay you $1.00 for that delicious cup of lemonade.

Cup and straw = 0.05
Lemons = 0.15
Sugar = 0.10
Total = 0.30
Earnings Quality

I will pay you $1.00 for that delicious cup of lemonade

That's perfect (my precious)!

Cup and straw = 0.05
Lemons = 0.15
Sugar = 0.10
Total = 0.30
Chris’ earnings

Revenue:
  Cup of Lemonade = $1.00

Expenses:
  Costs of goods sold = -0.30

\[
\text{Earnings} = 0.70
\]
Earnings Quality

- Milli starts a business

Cups and straws = 1.00
Lemons = 1.00
Box of sugar = 2.00
Total Costs = 4.00
Earnings Quality

I will pay you $1.00 for that lemon sugar drink

Cup and straws = 1.00
Lemons = 1.00
Box of sugar = 2.00
Total = 4.00
Earnings Quality

I will pay you $1.00 for that lemon sugar drink

Cup and straws = 1.00
Lemons = 1.00
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Total = 4.00
Earnings Quality

Cup and straws = 1.00
Lemons = 1.00
Box of sugar = 2.00
Total = 4.00

I will pay you $1.00 for that lemon sugar drink

TOMORROW

IT’S A DEAL!
Earnings Quality 2

Milli’s Earnings
(on a cash basis)

Revenue: = 0

Expenses: = $ -4.00

Cash earnings = -4.00

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Cup and straws = 1.00
Lemons = 1.00
Box of sugar = 2.00

Total = 4.00
Comparison of CASH FLOWS

Chris’

Cash flows

0.70

Milli’s

Cash flows

$-4.00

Similar transaction occurred but cash-based performance looks very different
Accrual Accounting

THE TIMING OF CASH FLOW RECEIPTS AND PAYMENTS IS NOT IMPORTANT

Focus on underlying economics
Milli’s Earnings:
(Accrual basis)
Revenue:
Cup of Lemonade = $1.00
Expenses:
Costs of good sold = 0.30
\[
\text{Earnings} = 0.70
\]
Comparison of ACCRUAL EARNINGS

Chris’

EARNINGS

0.70

Milli’s

EARNINGS

$0.70

Earnings on accrual basis makes businesses comparable
Reconciling Earnings to Cash Flows

Chris

Earnings = cash flows + accruals

0.70 = 0.70 + 0

Milli’s

Earnings = cash flows + accruals

0.70 = $-4.00 + $4.70

Earnings are the same even though cash flows are very different.

ACCRUALS = + 1.00 + 3.70

$4.70
Quality Issues with Milli’s accruals

Accounts Receivable

Sold Lemonade!
Timely useful information

Gandalf may disappear

I will pay you $1.00 for that cup of lemonade

TOMORROW

IOU
1.00

GOOD NEWS

BAD NEWS
Milli’s accruals

Inventory

High inventory: Milli anticipates future sales!

Obsolete inventory
Nobody wants to buy lemonade
Comparison of Business Models

Chris’
Has Cash!!
Simple business

Milli’s
Accruals are indicators of growth in RISKY investments
Accruals estimate these investments but they could be wrong

ACCRUALS = + 1.00 + 3.70

0.70 cash
Comparison of Earnings Quality

Chris’ earnings:

Earnings = cash flows + accruals

0.70 = 0.70 + 0

0.70 cash

Milli’s earnings:

Earnings = cash flows + accruals

0.70 = $-4.00 + $4.70

Accruals can be fuzzy and contain errors. Chris’ earnings are higher quality than Milli’s.
Operationalizing Earnings Quality

- Empirical evidence earnings persistence

\[ \text{Earnings}_{t+1} = \alpha + \beta \text{Earnings}_t + \varepsilon \]

- Chris’ \( \beta \) > Milli’s \( \beta \)

\[ 0.85 \quad > \quad 0.65 \]
Operationalizing Earnings Quality

• Concept of earnings persistence

• \[ \text{Earnings}_{t+1} = \alpha + \beta_1\text{Cash flows}_t + \beta_2\text{Accruals}_t + \varepsilon \]

\[ \beta_1 > \beta_2 \]
Understanding Earnings Quality

EARNINGS = CASH FLOWS + ACCRUALS

Earnings Quality research tries to disentangle

“Good” Accruals that correctly reflect the business

“Bad” Accruals that reflect errors, manipulation, and overinvestment
Factors that Affect Earnings Quality

Underlying Economics
- Industry Structure
- Firm Structure and Investment Opportunities
- Stage of Life Cycle

Accrual Accounting System
- FASB/IFRS RULES
- Management Application of Rules
- Internal Controls Audit Quality Governance

Earnings Quality
Philosophical Question:
What is objective of accrual accounting?
• **Philosophical Question:**
  
  • What is objective of accrual accounting?

1. *Economic perspective:*
   - Investors care about firm value. The objective is to measure the *value* of assets and liabilities.

2. *Performance evaluation*
   - Investors want to know what management did this period. The objective is to measure how much *income* was generated this period.
Economic Perspective

Assets_t – Liabilities_t = Shareholders’ Equity_t

Measure the value
Economic Perspective

\[ \text{Assets}_t - \text{Liabilities}_t = \text{Shareholders' Equity}_t \]

Measure the value

\[ \text{Assets}_{t+1} - \text{Liabilities}_{t+1} = \text{Shareholders' Equity}_{t+1} \]

Measure the value
Economic Perspective

\[
\text{Assets}_t - \text{Liabilities}_t = \text{Shareholders’ Equity}_t
\]

\[
\text{Assets}_{t+1} - \text{Liabilities}_{t+1} = \text{Shareholders’ Equity}_{t+1}
\]

\[\Delta \text{Value} = \text{Income}\]
Economic Perspective

\[ \text{Assets}_t - \text{Liabilities}_t = \text{Shareholders' Equity}_t \]

\[ \text{Assets}_{t+1} - \text{Liabilities}_{t+1} = \text{Shareholders' Equity}_{t+1} \]

\( \Delta \text{Value} = \text{Income} \)

Market Values Follow a Random Walk
Economic Perspective

\[ \text{Assets}_t - \text{Liabilities}_t = \text{Shareholders' Equity}_t \]

\[ \text{Assets}_{t+1} - \text{Liabilities}_{t+1} = \text{Shareholders' Equity}_{t+1} \]

\[ \Delta \text{Value} = \text{are transitory and unpredictable} \]

Market Values Follow a Random Walk
Operationalizing Earnings Quality

• Concept of earnings persistence

\[ \text{Earnings}_{t+1} = \alpha + \beta \text{Earnings}_t + \varepsilon \]

\[ \beta = 0 \]  

Economic or Balance Sheet Perspective
Accounting Rules and Standards

Balance Sheet Perspective

Goodwill: Fair value – no amortization
Marketable securities: Fair Value
Impairments of assets: Fair Value
Capital Leases: Fair Value
Deferred Revenue (Fair Value of Component)
Debt – Fair Value
Securitization – Fair value
Inventory – lower of market or cost
Accounting Rules and Standards

Balance Sheet Perspective

- Goodwill: Fair value – no amortization
- Marketable securities: Fair Value
- Impairments of assets: Fair Value
- Capital Leases: Fair Value
- Deferred Revenue (Fair Value of Component)
- Debt – Fair Value
- Securitization – Fair value
- Inventory – lower of market or cost

Transitory gains and losses muddies up earnings
Philosophical Question:

What is objective of accrual accounting?

1. Economic perspective:
   - Investors care about firm value. The objective is to measure the value of assets and liabilities.

2. Performance evaluation (Income Statement perspective):
   - Investors want to know what management did this period. The objective is to measure how much income was generated this period.
INCOME measures how much sustainable cash flows the managers generated.
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Performance Evaluation

Accruals alter the timing of cash flow recognition in earnings
To be identify firm performance

\[ \text{CASH FLOWS}_t \]

\[ \text{INCOME}_t \]

\[ \text{Cash flows}_{t-2}, \text{Cash flows}_{t-1}, \text{Cash flows}_{t+1}, \text{Cash flows}_{t+2} \]
Performance Evaluation

More Timely and Relevant

INCOME_t

Cash flows_{t-2}  Cash flows_{t-1}  CASH FLOWS_t  Cash flows_{t+1}  Cash flows_{t+2}

Assets = Spent cash in past
DR: (capitalized cost)

Liabilities = Received cash in past
CR: (Deferred Revenue)

Assets = Receive cash in future
DR: (Accounts Receivable)

Liabilities = Spend cash in future
CR: (Accounts payable)

Balance Sheet’s Role

Keeps track of the cash allocation and reversals
Operationalizing Earnings Quality

• Concept of earnings persistence

• $Earnings_{t+1} = \alpha + \beta Earnings_t + \varepsilon$

Income Statement Perspective

$\beta \Rightarrow 1$
Revenue Recognition: *Does not allow the anticipation of future sales*
Cost of Goods Sold: match to revenue
Depreciation: allocate over time
Operating Leases: as paid
Software: Capitalize when technological feasibility
Deferred Revenue allocate over time
Revenue Recognition: Does not allow the anticipation of future sales
Cost of Goods Sold: match to revenue
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Operating Leases: as paid
Software: Capitalize when technological feasibility
Deferred Revenue allocate over time

Income Statement Perspective

Mix of both

Balance Sheet Perspective

Goodwill: Fair value – no amortization
Marketable securities: Fair Value
Impairments of assets: Fair Value
Capital Leases: Fair Value
Deferred Revenue (new rules)
Impaired Debt – Fair Value
Securitization – Fair Value
**Revenue Recognition:** Does not allow the anticipation of future sales

**Cost of Goods Sold:** match to revenue

**Depreciation:** allocate over time

**Operating Leases:** as paid

**Software:** Capitalize when technological feasibility

**Deferred Revenue:** allocate over time

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**Income Statement Perspective**

**Balance Sheet Perspective**

- **Goodwill:** Fair value – no amortization
- **Marketable securities:** Fair Value
- **Impairments of assets:** Fair Value
- **Capital Leases:** Fair Value
- **Deferred Revenue (new rules):**
- **Impaired Debt – Fair Value**
- **Securitization – Fair value**

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**Historical Costs on Balance sheet**

**Transitory gains and losses go through income**
Accounting Rules and Standards

Mix up both

Revenue Recognition: 
Cost of Goods Sold: matching
Depreciation: allocate over time
Operating Leases: as paid
Software: Technological feasibility
Deferred Revenue (old rules)

Fair value
Marketable securities: Fair Value
Impairments of assets: Fair Value
Capital Leases: Fair Value
Deferred Revenue (new rules)
Impaired Debt – Fair Value
Securitization – Fair value

CONSERVATISM

Transitory gains and losses go through income

Historical Costs on Balance sheet

Income Statement Perspective

Balance Sheet Perspective
Revenue Recognition:
- Cost of Goods Sold: matching
- Depreciation: allocate over time
- Operating Leases: as paid
- Software: Technological feasibility
- Deferred Revenue (old rules)

Revenue Recognition (new rules):
- Deferred Revenue (new rules)
- Impaired Debt – Fair Value
- Securitization – Fair value

CONSERVATISM:
- Use CASH BASIS
- Expense R&D
- Expense start up costs
- Expense SG&A

Historical Costs on Balance sheet

Transitory gains and losses go through income
Accounting Rules and Standards

Mix up both

Income Statement Perspective

Revenue Recognition:
Cost of Goods Sold: matching
Depreciation: allocate over time
Operating Leases: as paid
Software: Technological feasibility
Deferred Revenue (old rules)

Balance Sheet Perspective

Fair value
Marketable securities: Fair Value
Impairments of assets: Fair Value
Capital Leases: Fair Value
Deferred Revenue (new rules)
Impaired Debt – Fair Value
Securitization – Fair value

CONSERVATISM

CASH BASIS
Expense R&D
Expense start up costs
Expense SG&A

Use Fair Values on the **downside**

Historical Costs on Balance sheet

But not on the upside

Transitory gains and losses go through income
ACCRUAL ACCOUNTING TENSION

Income Statement Perspective

Balance Sheet Perspective
ACCRUAL ACCOUNTING TENSION

Income Statement Perspective

Balance Sheet Perspective

Standard Setters
Fund Managers
Debt holders (in firms in Financial distress)
Academics

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School of Business
ACCRUAL ACCOUNTING TENSION

Income Statement Perspective
Management
Financial Analysts
Investors
Media
Compensation consultants
Auditors

Balance Sheet Perspective
Standard Setters
Fund Managers
Debt holders (in firms in Financial distress)
Academics
Operationalizing Earnings Quality

- Concept of earnings persistence

- $\text{Earnings}_{t+1} = \alpha + \beta \text{Earnings}_t + \varepsilon$

\[\beta > \beta\]

Income Statement Perspective

Balance Sheet Perspective
Factors that Affect Earnings Quality

Underlying Economics
- Industry Structure
- Firm Structure and Investment Opportunities
- Stage of Life Cycle

Accrual Accounting System
- FASB/IFRS RULES
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Consequence of moving accrual accounting to a balance sheet focus

• Declining association of stock returns with earnings
• Declining matching role of accruals
• Declining persistence of GAAP earnings
Matching implies a negative correlation between Cash flows and Accruals

Low accruals
Low cash flows
(positive correlations)

High accruals
Low cash flows
(negative correlations)

Source: Dechow and Ge (2005)
Ranking on Accruals

Correlation between Cash flows and Accruals

Low accruals
Low cash flows
(positive correlations)

High accruals
Low cash flows
(negative correlations)

Figure 2: The correlation between cash flow and accruals across accruals deciles.
Ranking on Accruals

Correlation between Cash flows and Accruals

**Low accruals**
- Low cash flows (positive correlations)

**Balance Sheet role**
- Distressed firms – Low EARNINGS
- Taking write-offs (low accruals that are transitory)

**High accruals**
- Low cash flows (negative correlations)

**Income statement Role**
- Matching: Low Cash flows
- Accruals indicate Large investments

Source: Dechow and Ge (2005)
Ranking on Accruals

Correlation between Cash flows and Accruals

Low accruals
Low cash flows
(positive correlations)

Balance Sheet role
Distressed firms – Low EARNINGS
Taking write-offs
(low accruals that are transitory)

High accruals
Low cash flows
(negative correlations)

Two types of firms have low cash flows

Distressed firms – taking write-offs (low accruals)
Growth firms – investing heavily (high accruals)

Income statement Role
Matching:
Low Cash flows
Accruals indicate Large investments
Matching role of accruals has declined

\[ TACC_{i,t} = \beta_0 + \beta_1 CFO_{i,t-1} + \beta_2 CFO_{i,t} + \beta_3 CFO_{i,t+1} + e_{i,t} \]
Accruals Association with Cash Flows

Newer cohorts (technology) do not have a negative association between cash flows and accruals.
Matching role of accruals has declined

\[ TACC_{i,t} = \beta_0 + \beta_1 CFO_{i,t-1} + \beta_2 CFO_{i,t} + \beta_3 CFO_{i,t+1} + e_{i,t} \]

Panel B: Coefficients $\beta_1 \beta_2 \beta_3$:

- $\beta_1 CFO_{i,t-1}$
- $\beta_3 CFO_{i,t+1}$
- $\beta_2 CFO_{i,t}$
Good News: BB still Holds!
(replication of Ball and Brown 1968)
Data 1971-2012

Figure 2
This replication of Ball & Brown (1968) suggests that their seminal findings of cumulative abnormal stock returns to positive and negative annual earnings surprises remain evident in the past 40 years. The earnings announcement occurs in month 0, and we plot the cumulative abnormal returns over the [-12, 6] month window for firms with positive (negative) annual earnings surprises and for all firms. Our sample is comprised of 165,224 firm-years from 1971 to 2012 that have non-missing earnings, returns, and earnings announcement dates. For brevity, we only display the results for the full sample.
Good news: Earnings Announcements Still Informative

Volume

Price Residual

Source: Dechow, Sloan, and Zha (2014)
Earnings vs. cash flows association with stock returns over time

Figure 3
The adjusted $R^2$ of annual cross-sectional price regressions allows us to compare the explanatory power of earnings measures (earnings, earnings before special items, and “street” earnings) versus cash flow measures (CFO, FCF, and total NCF) with respect to stock prices.

Source: Dechow, Sloan, and Zha (2014)
Earnings vs. cash flows association with stock returns over time

Figure 3
The adjusted $R^2$ of annual cross-sectional price regressions allows us to compare the explanatory power of earnings measures (earnings, earnings before special items, and “street” earnings) versus cash flow measures (CFO, FCF, and total NCF) with respect to stock prices.

Source: Dechow, Sloan, and Zha (2014)
Market Solution

- Declining association of stock returns with earnings
- Declining matching role of accruals
- Declining persistence of GAAP earnings

Rise of management guidance
Rising use of non-GAAP performance metrics
Rising emphasis by management on meeting analysts’ non-GAAP EPS expectations
Factors that Affect Earnings Quality

Underlying Economics
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Accrual Accounting System
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- Internal Controls
- Audit Quality
- Governance

Voluntary Disclosures
- Guidance
- Non-GAAP metrics to aid in understanding EQ
ACCRUAL ACCOUNTING TENSION

Income Statement Perspective
- Management
- Financial Analysts
- Investors
- Media
- Compensation
- Auditors

Balance Sheet Perspective
- Standard Setters
- Fund Managers
- Value investors in Financial distress
- Academics

Market’s Solution
- Voluntary Disclosures
- Guidance
- Non-GAAP metrics to aid in understanding EQ

EQ
Is the market solution good?
• Roll-up strategy:
  – Grow by acquiring companies with existing drugs
  – Cut R&D, layoff workers, increase the price of patented drugs

• Strategy relies on easy access to capital markets to fund acquisitions
• Valeant consistently met analysts’ expectations

Beat analysts’ EPS forecasts
(26 times of 31 Quarters)

Analysts forecast of EPS
J. Michael Pearson,
(started his reign as CEO and COB in 2008)
Strategy works: Stock Price increases **2000 percent**:

By 2015 Pearson had nearly $3Billion in stock and options.
J. Michael Pearson,  
(started his reign as CEO and COB in 2008)

- Valeant consistently met analysts’ expectations

Beat analysts’ EPS forecasts  
(26 times of 31 Quarters)

How did they consistently beat?

Reported proforma EPS or “cash EPS”  
(excludes amortization of intangible assets such as drug patents, goodwill write-offs, layoff costs, acquisition costs, etc.)

Analysts forecast of EPS  
2008  
2015
Valeant’s Reconciliation

Non-GAAP Adjustments to Reconcile GAAP EPS to Cash EPS

- Amortization and impairments of finite-lived intangible assets and other non-GAAP charges ($M)
- Restructuring, integration, acquisition-related and other costs ($M)
- Total adjustments ($M)
But then, questions started being raised about sustainability and ethics of Valeant’s strategy:

J. Michael Pearson, CEO
J. Michael Pearson, CEO

- Price tumbled today it is $15

Valeant was not a stock that created real economic growth

But, was a Darling of Wall Street
- Met expectations
- Raised financing
- Positive stock price momentum
- High institutional ownership
- Strong analyst following

Valeant Stock’s Roller Coaster Ride with Bill Ackman

Source: Bloomberg

Stacy Jones/Fortune
Do firms manipulate to consistently meet expectations?

• Tools:
  – Guidance
  – Put in more effort
  – Take real economic actions: “real” earnings management
  – Massage accruals
Factors that Affect Earnings Quality

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Earnings Quality

Voluntary Disclosures Guidance
Non-GAAP metrics to aid in understanding EQ

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Percent of Manipulating firms consistently beat analysts’ expectations before and during the manipulation period.

Source: Chu, Dechow, Hui, and Wang (2018)
Manipulating firms have **high accruals before** and during manipulation period – consistent with the use of more accounting flexibility.

Panel A: Working capital accruals.
Implications

• Earnings quality and properties of accruals have changed over time:
  – Balance sheet focus combined with conservatism – fair values on the downside
  – Conservatism – cash basis - lack of capitalizing investment costs and so no creation of accruals in technology firms
• Rise of non-GAAP earnings to solve these problems
• Continuing pressure on management to guide and meet expectations
What can we do?
What can we do?
Project with Chad Larson and Bob Retesuk

Earnings = Cash Flows + Accruals

Earnings = CFO + \(\Delta\)WC Accruals + Depreciation + (FOPO)

BIG DATA PROJECT
Dechow, Larson, Retesuk (2018)
For each firm-year on Compustat go to SEC filings – find the Statement of Cash Flows and determine what is included in FOPO
Data Analysis
(Raw Line Item Data)

• Messy but manageable
• 188,132 FOPO lines for 67,839 firm years (2.77 lines per firm year)
• Nearly 40,000 unique line item descriptions
  – Over 2,000 unique ways to describe bad debt expense
  – provision for doubtful accounts, provision for loan losses, provision for losses on accounts receivable, provision for bad debts, bad debt expense, allowance for doubtful accounts, provision for credit losses, provision for doubtful accounts receivable, provision for uncollectible accounts, provision for losses on receivables, provision for bad debt, provision for loan and lease losses, provision for uncollectible accounts receivable, provision for allowance for doubtful accounts, provision for
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</table>
Findings so far...

• Many “unusual and infrequent” items are consistently reported by firms
  – E.g., restructuring charges, gains and losses on MS
  – Relate to specific industries (bad debts)

• Persistence and consistency are different aspects of EQ
OBJECTIVE OF DATA BASE

• GIVE RESEARCHERS THE DATA TO
• Better understand the details of specific accruals – determine their characteristics
• Develop improved discretionary accrual models
• Develop industry level models
• Develop new approaches to thinking of EQ
• Provide new insights into understanding transitory components in earnings
Factors that Affect Earnings Quality

Underlying Economics

- Industry Structure
- Firm Structure and Investment Opportunities
- Stage of Life Cycle

Earnings Quality

- Big Data Analysis
- Unconventional approaches

Voluntary Disclosures
- Guidance
- Non-GAAP metrics to aid in understanding EQ

Accrual Accounting System

- FASB/IFRS RULES
- Management Application of Rules
- Internal Controls
- Audit Quality Governance

Big Data Analysis
- Unconventional approaches
- Voluntary Disclosures
- Guidance
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Industry Structure
- Firm Structure and Investment Opportunities
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USC Marshall
School of Business
University of Southern California
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Accrual Accounting System
- Earnings Quality
- FASB/IFRS Rules
- Accrual Accounting System

Governance Structure
- Management Evaluation of Risks
- Governance
- Voluntary Disclosure
- Guidance
- Non-GAAP metrics to aid in understanding EQ

Voluntary Disclosure Guidance
- Non-GAAP metrics to aid in understanding EQ

Incentive Compensation
- Internal Controls
- Audit Quality
- Governance
- CEO/Executive team
- Overconfidence, Narcistic, competitive
Factors that Affect Earnings Quality

Underlying Economics
- Industry Structure
- Firm Structure and Investment Opportunities
- Stage of Life Cycle
- Influence of outside experts: lawyers, compensation consultants
- Influence of taxes

Accrual Accounting System
- FASB/IFRS Rules
- Accrual Accounting System
- Big Data Analysis
- Conventional Approaches
- Voluntary Disclosures
- Guidance
- Non-GAAP metrics to aid in understanding EQ

Governance Structure
- Management of Information
- Internal Controls
- Audit Quality
- Governance

Incentive Compensation
- Attitude at the top CEO/Executive team
- Overconfidence, Narcistic, competitive
- Influence of taxes
- Outside experts: lawyers, compensation consultants
THANK YOU!